

AMENDMENTS TO THE CLAIMS

The following is a complete listing of all claims in the subject application with the status of each claim being indicated in a parenthetical expression. Claims 1-10, 12-23, 25, 27 and 28 being amended herewith are presented with markings showing the changes made relative to the immediate prior version. Claims 11, 24 and 26 not being amended herewith are presented in clean version. Claims 29-46 were previously canceled.

1. (Currently Amended) An intraoperative neural monitoring system comprising
 - a power source; and
 - a stimulator powered by said power source to deliver ~~a complete cycle of~~ biphasic electrical stimulation for application to anatomical tissue, said stimulator delivering said electrical stimulation alternatively as a complete cycle of monophasic electrical stimulation having a selected number of positive or negative pulses, or a complete cycle of biphasic electrical stimulation as having a first group of a selected number of positive or negative pulses automatically followed by a second group of a selected number of pulses of reverse polarity to said pulses of said first group;
 - an activator for said stimulator actuatable by a user of said intraoperative neural monitoring system to start delivery of said electrical stimulation; and
 - a mode selector for said stimulator having a monophasic mode setting selectable by a user of said intraoperative neural monitoring system, prior to actuation of said activator, to set said stimulator to deliver said complete cycle of monophasic electrical stimulation in response to actuation of said activator to start delivery of said electrical

stimulation, and having a biphasic mode setting alternatively selectable by a user of said intraoperative neural monitoring system, prior to actuation of said activator, to set said stimulator to alternatively deliver said complete cycle of biphasic electrical stimulation in response to actuation of said activator to start delivery of said electrical stimulation.

2. (Currently Amended) The intraoperative neural monitoring system recited in claim 1 wherein ~~said stimulator is powered by said power source to alternatively deliver~~ a monophasic mode setting includes a positive monophasic mode setting selectable by the user to set said stimulator to deliver said complete cycle of monophasic electrical stimulation for application to anatomical tissue and as all positive pulses and includes a negative monophasic mode setting alternatively selectable by the user to set said stimulator alternatively deliver said complete cycle of monophasic electrical stimulation as ~~a selected number of positive or~~ all negative pulses.

3. (Currently Amended) The intraoperative neural monitoring system recited in claim 2 wherein said biphasic mode setting includes a positive leading biphasic mode setting selectable by the user to set said stimulator to deliver said first group of pulses is selectable as being positive or negative pulses and includes a negative leading biphasic mode setting alternatively selectable by the user to set said stimulator to alternatively deliver said first group of pulses of said complete cycle of monophasic electrical stimulation are selectable as being all positive or all negative pulses.

4. (Currently Amended) The intraoperative neural monitoring system recited in claim 3 and further including a stimulation level selector for said stimulator operable by a user of said intraoperative neural monitoring system to set ~~wherein said pulses are selectable to have~~ a current amplitude for said pulses from 0 to 200 mA.

5. (Currently Amended) The intraoperative neural monitoring system recited in claim 4 wherein said stimulation level selector automatically sets the current amplitude of said pulses of said second group ~~is to be~~ the same as ~~said the~~ current amplitude of said pulses of said first group.

6. (Currently Amended) The intraoperative neural monitoring system recited in claim 4 and further including a repetition selector for said stimulator operable by a user of said intraoperative neural monitoring system, prior to actuation of said activator, to set ~~wherein~~ the number of said pulses in each of said first group and said second group ~~is selectable to be 1 to 8 pulses and to alternatively set~~ the number of said pulses in said complete cycle of monophasic electrical stimulation ~~is selectable to be 1 to 8 pulses.~~

7. (Currently Amended) The intraoperative neural monitoring system recited in claim 6 wherein said repetition selector automatically sets the number of said pulses in said second group ~~is to be~~ the same as the number of said pulses in said first group.

8. (Currently Amended) The intraoperative neural monitoring system recited in claim 4 and further including a pulse width selector for said stimulator operable by a

user of said intraoperative neural monitoring system to set wherein said pulses are selectable to have a duration in the range of 100 to 500 microseconds.

9. (Currently Amended) The intraoperative neural monitoring system recited in claim 4 wherein said stimulator delivers said complete cycle of biphasic electrical stimulation ~~includes~~ with there being a predetermined fixed interval between said first group of pulses and said second group of pulses of about 2 seconds.

10. (Currently Amended) The intraoperative neural monitoring system recited in claim 4 and further including a delay selector for said stimulator operable by a user of said intraoperative neural monitoring system to set wherein said complete cycle of biphasic electrical stimulation ~~comprises~~ to have a delay between successive pulses in each of said first group and said second group of pulses in the range of 2 to 4 milliseconds and to alternatively set and said complete cycle of monophasic electrical stimulation ~~includes~~ to have a delay between successive pulses, ~~said delay being selectable to be~~ in the range of 2 to 4 milliseconds.

11. (Original) The intraoperative neural monitoring system recited in claim 1 wherein said power source comprises a power console electrically connectible to said stimulator.

12. (Currently Amended) An intraoperative neural monitoring system comprising a power source;

a stimulator powered by said power source to deliver ~~a complete cycle of~~ biphasic electrical stimulation for application to anatomical tissue, said stimulator being capable of delivering said electrical stimulation as a complete cycle of biphasic electrical stimulation as having a first group of one or more positive or negative pulses followed by a second group of one or more pulses of opposite polarity to said pulses of said first group; and

an activator for said stimulator actuatable by a user of said intraoperative neural monitoring system completing performance of a multi-step manual actuation procedure with said activator to ~~complete an activation that starts~~ start delivery of said first group of pulses, said ~~activation being effective to deliver~~ stimulator delivering said complete cycle of biphasic electrical stimulation in its entirety in response to actuation of said activator to start delivery of said first group of pulses.

13. (Currently Amended) The intraoperative neural monitoring system recited in claim 12 wherein said activator is actuatable ~~to complete said activation in~~ by a user of said intraoperative neural monitoring system completing performance of a two-step manual actuation procedure ~~performed by the user with said activator to start delivery of~~ said first group of pulses.

14. (Currently Amended) The intraoperative neural monitoring system recited in claim 13 wherein said activator comprises a hand switch having a button, and said activator is actuatable by a user of said intraoperative neural monitoring system pressing said button consecutively two times to start delivery of said first group of pulses.

15. (Currently Amended) The intraoperative neural monitoring system recited in claim 13 ~~and further comprising~~ wherein said power source comprises a power console electrically ~~connected~~ connectible to said stimulator, said power console having a touch screen, and said activator comprises a ~~control~~ an activate option and an accept option on said touch screen, and said activator is actuatable by a user of said intraoperative neural monitoring system pressing said activate option and thereafter pressing said accept option to start delivery of said first group of pulses.

16. (Currently Amended) The intraoperative neural monitoring system recited in claim 12 wherein said stimulator is ~~powered by said power source to alternatively deliver~~ capable of delivering said electrical stimulation as a complete cycle of monophasic electrical stimulation for application to anatomical tissue, said stimulator delivering said complete cycle of monophasic electrical stimulation as having one or more positive or negative pulses, and further including a mode selector for said stimulator operable by a user of said intraoperative neural monitoring system, prior to actuation of said activator, to select said complete cycle of biphasic electrical stimulation for delivery by said stimulator and to alternatively select said complete cycle of monophasic electrical stimulation for delivery by said stimulator, said activation is effective activator being alternatively actuatable by a user of said intraoperative neural monitoring system completing performance of said multi-step manual actuation procedure with said activator to deliver alternatively start delivery of said complete cycle of monophasic electrical stimulation, said stimulator delivering said complete cycle of monophasic electrical stimulation in its entirety in response to actuation of said activator

to start delivery of said complete cycle of monophasic electrical stimulation.

17. (Currently Amended) An intraoperative neural monitoring system comprising

a power console providing a power source and a display screen;

a patient interface unit electrically connectible to said power console, said patient interface unit being connectible to monitoring electrodes placed at areas of a patient's body to detect responses to a first form of electrical stimulation and a second form of electrical stimulation for display on said display screen, said patient interface unit being connectible to monopolar and bipolar stimulating probes for applying said first form of electrical stimulation to anatomical tissue of the patient, said patient interface unit delivering said first form of electrical stimulation up to a current amplitude of about 30mA; and

a stimulator electrically connectible to said power console, said stimulator being connectible to a pair of stimulating electrodes placed at areas of a patient's body for applying said second form of electrical stimulation to anatomical tissue of the patient, said stimulator delivering said second form of electrical stimulation to a first one of the stimulating electrodes for return via a second one of the stimulating electrodes in a positive phase for said second form of electrical stimulation and delivering said second form of electrical stimulation to the second one of the stimulating electrodes for return via the first one of the stimulating electrodes in a negative phase for said second form of electrical stimulation, said stimulator delivering said second form of electrical stimulation up to a current amplitude of about 200 mA;

an activator for said stimulator actuatable by a user of said intraoperative neural

monitoring system to start delivery of said second form of electrical stimulation from said stimulator; and

a mode selector for said stimulator having a plurality of mode settings alternatively selectable by a user of said intraoperative neural monitoring system to set said stimulator, prior to actuation of said activator, to deliver a finite cycle of said second form of electrical stimulation in a mode corresponding to the selected mode setting, said mode selector having a positive monophasic mode setting to set said stimulator to delivery a finite cycle of said second form of electrical stimulation in a positive monophasic mode having a selected number of pulses all of said positive phase, a negative monophasic mode setting to set said stimulator to deliver a finite cycle of said second form of electrical stimulation in a negative monophasic mode having a selected number of pulses all of said negative phase, a positive leading biphasic mode setting to set said stimulator to deliver a finite cycle of said second form of electrical stimulation in a positive leading biphasic mode having a first group of a selected number of pulses all of said positive phase automatically followed by a second group of a selected number of pulses all of said negative phase, and a negative leading biphasic mode setting to set said stimulator to deliver a finite cycle of said second form of electrical stimulation in a negative leading biphasic mode having a first group of a selected number of pulses all of said negative phase automatically followed by a second group of a selected number of pulses all of said positive phase.

18. (Currently Amended) The intraoperative neural monitoring system recited in claim 17 wherein said first form of electrical stimulation comprises continuous constant

current monophasic DC pulses and said pulses of said second form of electrical stimulation ~~comprises a cycle of a selectable number of~~ are constant current DC pulses, ~~said cycle having a mode selectable as a monophasic cycle or a biphasic cycle.~~

19. (Currently Amended) The intraoperative neural monitoring system recited in claim 18 wherein said ~~pulses in said monophasic cycle are all of said positive phase or all of said negative phase, and said pulses in said biphasic cycle comprise a first group of said pulses which are all of said positive phase or all of said negative phase followed by a second group of said pulses which are opposite in phase from said pulses of said first group~~ intraoperative neural monitoring system further includes means for detecting the duration of said pulses of said second form of electrical stimulation and means for terminating delivery of said second form of electrical stimulation automatically when the duration of a pulse of said second form of electrical stimulation is detected to exceed a predetermined duration.

20. (Currently Amended) The intraoperative neural monitoring system recited in claim ~~18~~ 19 wherein said pulses of said first form of electrical stimulation are selectable to have a pulse width in the range of 50 to 250 microseconds and a rate of 1 to 10 pulses/second, said pulses of said second form of electrical stimulation are selectable to have a pulse width in the range of 100 to 500 microseconds, said number of pulses in said finite cycle of said second form of electrical stimulation for said positive monophasic mode and said negative monophasic cycle mode is selectable to be in the range of 1 to 8 pulses, said number of pulses in said finite cycle of said second form of

electrical stimulation for said positive leading biphasic mode and said negative leading biphasic eyele mode is selectable to be in the range of 1 to 8 pulses for said first group and an equal number of pulses for said second group, said finite cycle of said second form of electrical stimulation for said biphasic eyele modes includes a fixed interval of about 2 seconds between said first group and said second group of pulses, said finite cycle of said second form of electrical stimulation for said biphasic eyele modes includes a delay between successive pulses in said first group and said second group, and said ~~monophasic~~ finite cycle of said second form of electrical stimulation for said monophasic modes includes said delay between successive pulses, and said delay is selectable to be in the range of 2 to 4 milliseconds.

21. (Currently Amended) The intraoperative neural monitoring system recited in claim 20 wherein said display screen comprises a touch screen presenting a plurality of displays including control options for selecting said pulse width for said first and second forms of electrical stimulation, said current amplitude for said first and second forms of electrical stimulation, said rate for said first form of electrical stimulation, said number of pulses for said first and second groups of pulses for said second form of electrical stimulation, said delay for said first and second forms of electrical stimulation, and for operating said mode selector.

22. (Currently Amended) The intraoperative neural monitoring system recited in claim ~~17~~ 19 ~~and further including an activator actuatable by a user for initiating delivery of said second form of electrical stimulation~~, wherein actuation of said activator to

~~initiate~~ start delivery of said second form of electrical stimulation effects delivery of said ~~monophasic~~ finite cycle ~~or said biphasic cycle~~ of said second form of electrical stimulation in its entirety.

23. (Currently Amended) The intraoperative neural monitoring system recited in claim ~~49~~ 17 wherein said patient interface unit includes a plurality of monitoring channels each connectible to a pair of monitoring electrodes.

24. (Original) The intraoperative neural monitoring system recited in claim 23 wherein said display screen includes a first monitoring display for displaying waveforms representing responses detected by the monitoring electrodes for each of said monitoring channels when said first form of electrical stimulation is applied to the patient and a second monitoring display for displaying waveforms representing responses detected by the monitoring electrodes for each of said monitoring channels when said second form of electrical stimulation is applied to the patient.

25. (Currently Amended) The intraoperative neural monitoring system recited in claim 24 wherein said second monitoring display includes a waveform display area for simultaneously displaying responses detected by the monitoring electrodes in response to said first group of pulses and said second group of ~~said pulses in~~ for said biphasic ~~cycle~~ modes.

26. (Original) The intraoperative neural monitoring system recited in claim 24

wherein said second monitoring display includes a waveform display area for simultaneously displaying responses detected by monitoring electrodes on the left and right sides of the patient's body.

27. (Currently Amended) The intraoperative neural monitoring system recited in claim 24 wherein said display screen comprises a touch screen, and said touch screen includes a control option for selecting an event threshold by which detected responses above said event threshold are signaled.

28. (Currently Amended) The intraoperative neural monitoring system recited in claim 24 wherein said display screen comprises a touch screen, and said touch screen includes a control option for setting an artifact delay by which the influence of artifact on detected responses is distinguished.

29-46. (Canceled)